



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,058	04/08/2004	Takehiro Suzuki	1035-505	7339
23117	7590	04/10/2006	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			LE, THAO X	
			ART UNIT	PAPER NUMBER
			2814	
DATE MAILED: 04/10/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/820,058

Applicant(s)

SUZUKI, TAKEHIRO

Examiner

Thao X. Le

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06 Mar. 2006 has been entered.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: an external connection terminal in claim 1 and an inner lead of claim 7.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "said inner lead" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "an inner lead on a surface of said bonding pad" in line 5 is unclear.

Claim Rejections - 35 USC § 102.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 7, 10 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6291331 to Wang et al.

Regarding claim 1, Wang discloses a semiconductor device in fig. 3, comprising:
a semiconductor substrate 10, col. 5 line 22, having formed thereon a semiconductor element (FET with gate 30, S/D 32/33), a first wiring layer 78, col. 6 line 19, formed on said semiconductor substrate 10 above an operating region 32 where said semiconductor element is formed, said first wiring layer 78 being electrically connected to said operating region 32, fig. 3; a second wiring layer 80, col. 6 line 19, formed on said semiconductor substrate 10 above said first wiring layer 78; and a bonding pad 100, col. 6 line 41, to be electrically connected to an external connection terminal, fig.

Art Unit: 2814

3, formed on said semiconductor substrate 10 above said second wiring layer 80, fig. 3, at least a part of said bonding pad 100 being located above said operating region 32, wherein said second wiring layer 80 includes a plurality of wirings 80, fig. 3, formed in the region under said bonding pad 100, a predetermined wiring 80 of said plurality of wirings 80 is connected to said bonding pad 100, fig. 3, and an insulating film 94, col. 7 line 1, is provided for insulating said bonding pad 100 from other wirings 80 than the predetermined wiring 80 among said plurality of wirings 80, wherein said insulating film 94 is formed over said other wirings 800 so as to directly contact the bonding pad 100, fig. 3; said other wirings 80 provided parallel to the edges of said bonding pad 100 are not formed in regions right under the edges, fig. 3; and said insulating film 94/96/98 is made up of an inorganic insulating film only, col. 7 line 1, so that no organic insulating film is provided between the other wiring 80 and the bonding pad 100.

With respect to "to be electrically connected to an external connection terminal" does not define a distinct structure. The bonding pad 100 of Wang would be capable of electrically connected to an external connection terminal.

Regarding claim 7, Wang discloses a semiconductor device in fig. 2 comprising: a semiconductor substrate 10 having formed thereon a semiconductor element (FET with gate 30 S/D 32/33); a first wiring layer 78 formed on said semiconductor substrate 10 at above an operating region 32 where said semiconductor element is formed, said first wiring layer 78 being electrically connected to said operating region 32; a second wiring layer 80 formed on said semiconductor substrate 10 at above said first wiring layer 78; and a bonding pad 100 to be electrically connected to an inner lead 70,

Art Unit: 2814

formed on said semiconductor substrate 10 at above said second wiring layer 80, at least a part of said bonding pad 100 being located right above said operating region 32, wherein said second wiring layer 80 includes a plurality of wirings 80 formed in the region right under said bonding pad 100, a predetermined wiring 80 of said plurality of wirings 80 is connected to said bonding pad 100, and an insulating film 94/96/98 is provided for insulating said bonding pad 100 from other wirings 80 than the predetermined wiring 80 among said plurality of wirings, and wherein said insulating film 94/96/98 is formed over other wirings so as to directly contact the bonding pad; said other wirings 80 provided parallel to edges of said bonding pad 100 are not formed in regions right under the edges of the regions electrically connected to the inner lead on the surface of said bonding pad 100, fig. 3; and said insulating film 94/96/98 comprises an inorganic insulating film only, so that a bottom surface of the bonding pad 100 does not contact any organic insulating film, fig. 3.

With respect to "to be electrically connected to an inner lead by an inner lead bonding process" do not carry weight in a claim drawn to structure. In re Thorpe, 277 USPQ 964 (Fed. Cir. 1985). In addition "to be electrically connected to an inner lead" does not define any distinct structure.

Regarding claim 10, Chittipeddi discloses the semiconductor device wherein said insulating film 94/96/98 is made up of a silicone oxide film and a silicone nitride film, formed by the CVD, col. 7 line 1.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2-5, 8-9, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Applicant Admitted Prior Art (APA).

Regarding claims 2-3, 8-9, Wang does not expressly disclose the in expanded regions right under said expanded regions as expanded with a stress in a process of electrically connecting said bonding pad to an external connection terminal, wherein respective lengths of the expanded regions in the expanding direction of said bonding pad are set to fall in a range of from 2 micron to 3 micron.

However, APA discloses in fig. 9 a semiconductor device comprises a wire 202 having bonding pad 201, an expanded regions right under said expanded regions 201a-b as expanded with a stress in a process of electrically connecting said bonding pad to an external connection terminal 208, fig. 9, wherein respective lengths of the expanded regions in the expanding direction of said bonding pad 201 are set to fall in a range of from 2 micron, see background of the invention in fig. 9. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to conclude that the bonding pad 27 of Chittipeddi would have the expanded regions as claimed. Where the claimed and the prior art products are identical or substantially identical in structure or

composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Regarding claims 4-5, Wang does not disclose the semiconductor device wherein said bonding pad 100 and said external connection terminal are electrically connected by the chip-on-glass or chip-on board.

However, APA discloses the semiconductor device wherein bonding pad 201 and said external connection terminal are electrically connected by the chip-on-glass (COG) or TCP, see background of the invention. At the time the invention was made; it would have been obvious to one of ordinary skill in the use the teaching of APA with Wang for intended use because the recitation 'chip-on-glass' or 'chip-on-board' of the claimed invention does not result in a structural difference between the claimed invention and the prior art, thus claimed invention is only an art recognized suitability for an intended purpose, MPEP 2144.07.

Regarding claim 11, Wang discloses a semiconductor device in fig. 3, comprising: a semiconductor substrate 10 having formed thereon a semiconductor element (FET with gate 30 and S/D 32/33); a first wiring layer 78 formed on said semiconductor substrate 10 at above an operating region 32 where said semiconductor element is formed, said first wiring layer 78 being electrically connected to said operating region 32; a second wiring layer 80 formed on said semiconductor substrate 10 at above said first wiring layer 78; and a bonding pad 100 to be electrically connected to an external connection terminal, fig. 3, formed on said semiconductor

Art Unit: 2814

substrate 10 at above said second wiring layer 80, at least a part of said bonding pad 100 being located right above said operating region 32, wherein said second wiring layer 80 includes a plurality of wirings 80, a predetermined wiring 80 of said plurality of wirings is connected to said bonding pad 100, and an insulating film 94/96/98 is provided for insulating said bonding pad 100 from other wirings 10 than the predetermined wiring 80 among said plurality of wirings 80, and wherein said insulating film is formed above said other wirings 80 so as directly contact the bonding pad 100, fig. 3; said other wirings 80 are formed so as to avoid regions right under the edges in the lengthwise direction of said bonding pad 100 and said insulating film includes an inorganic insulating film, so that no organic insulating film is provided between the other wiring 80 and the bonding pad 100, fig. 3.

But Wang does not expressly disclose under the edges in the lengthwise direction of bonding pad to 3 micron outside the region.

However, Wang clearly discloses a general distance from the edge of the bonding pad 100 to the second wire layer 80. Accordingly, it would have been obvious to one of ordinary skill in art to use the general distance teaching of Wang in the range as claimed, because it has been held that where the general conditions of the claims are discloses in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 12, Wang discloses the semiconductor device wherein said insulating film 94/96/98 is made up of an inorganic insulating film only.

Regarding claim 13, Wang discloses the semiconductor device wherein at least a part of said other wirings 80 is formed in a region right under said bonding pad 100, and other wirings 80 formed in the region right under the bonding pad 100 are formed only in a region right under a region electrically connected to an inner lead 70 on a surface of said bonding pad 100, fig. 3.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

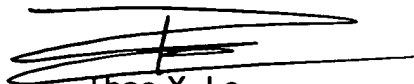
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/820,058

Page 10

Art Unit: 2814

A handwritten signature in black ink, appearing to read 'Thao X. Le', with a horizontal line drawn through it.

Thao X. Le
03 April 2006